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7590	06/28/2005			EXAMINER PATHAK, SUDHANSU C
PILLSBURG WINTHROP LLP INTELLECTUAL PROPERTY GROUP P.O. BOX 10500 MCLEAN, VA 22102			ART UNIT 2634	PAPER NUMBER

DATE MAILED: 06/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/764,202	RAFIE ET AL.
	Examiner	Art Unit
	Sudhanshu C. Pathak	2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on February 1st, 2005.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-43 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) 25-36 and 42 is/are allowed.
 6) Claim(s) 1-24, 37-41 and 43 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on February 1st, 2005 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date 1.

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date _____.
 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____

DETAILED ACTION

1. Claims 1-to-43 are pending in the application.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 16, 18 & 37-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.
3. The Claims 16 & 18 disclose the second channel information, it is not clear as to where this is disclosed in the specification.
4. The Claims 37-41 discloses a phase correction apparatus comprising means for using data of the distorted signal for removing modulated signals from the coarse estimate of carrier phase to produce a carrier estimate. It is not clear from the specification as to the meaning of the "modulated signals". The specification on Page 19, lines 18-23 discloses multiple signals that modulate the carrier, and removed in the receiver, i.e. modulating data and channel noise (distortions). Furthermore, the specification in Page 19, lines 22-23 discloses ".....the modulating data are removed through decision-directed phase recovery. The fine measurement of the phase is now carried out over these M symbols.....".

The claim should actually be ".....removing the modulated signals (demodulation of the distorted signal) from the coarse estimate and using the data to produce a carrier estimate.....".

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 16 recites the limitation "the first and second channel information" in line 2.

There is insufficient antecedent basis for this limitation in the claim i.e. the second channel information.

7. Claim 18 recites the limitation "the second channel information" in line 4. There is insufficient antecedent basis for this limitation in the claim

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 1, 2 & 15-18 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claim 26 (which includes the limitations of claims 23-25) of copending Application No.

09/849,687 (PG-Pub No. 2002/0196844). Although the conflicting claims are not identical, they are not patentably distinct from each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Regarding to Claims 1 & 15-18:

The claim recites a method for receiving radio signals in a multiple hopping radio system comprising hopping among a plurality of radio links and receiving bursts of radio signals on the plurality of radio links. This limitation is disclosed in Claim 26 of the copending application, which discloses a method for receiving radio signals in a link hopping, burst mode radio receiver comprising receiving a first burst on a first radio link and receiving a first burst on a second radio link.

The claim also recites determining channel information for each radio link from a received burst on the radio link. This limitation is disclosed in Claim 26 of the copending application, which discloses determining the channel information for the second radio link.

The claim also recites storing the determined channel information and using the determined channel information for the radio link to receive a next received burst on the radio link. This limitation is disclosed in Claim 26 of the copending application, which discloses determining channel information for a second radio link and storing equalizer weights for the second radio link for subsequent use and using the stored information as initial equalizer weights of the first equalizer for a second burst of the second radio signal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Claim 26 of the copending application teaches all the limitations of Claim 1 of the application. Furthermore, Claim 26 teaches determining the channel information of the second link this is a matter of design choice and there is no criticality in determining the channel information of each radio link. The equalizer weights are determined using the channel information and storing the equalizer weights for subsequent use, this is analogous to using the stored channel information for the radio link to reliably receive the next burst.

Regarding to Claim 2:

The claim dependent on Claim 1, recites a method for receiving radio signals further comprising equalizing received radio signals according to updated equalizer weights and updating the equalizer weights for the next received burst using the determined channel information from a received burst. This limitation is disclosed in Claim 26 of the copending application, which discloses determining equalizer weights of the first equalizer and subsequently receiving the next burst using the equalizer weights obtained in the first burst as initial values. The claim 26 also discloses storing equalizer weights of a second adaptive equalizer at the end of the current burst to be used in a fixed equalizer to compensate for amplitude and phase variations of the subsequent bursts. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Claim 26 of the copending application teaches all the limitations of Claim 2 of the application.

10. Claim 3 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claim 15 (which includes the limitations of claim 1) of copending Application No. 09/849,687 (PG-Pub No. 2002/0196844). Although the conflicting claims are not identical, they are not patentably distinct from each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Regarding to Claim 3:

The claim dependent on Claim 1, recites a method for receiving radio signals further comprising the received bursts of the radio signals comprising receiving one of data burst and an invitation burst. This limitation is disclosed in Claim 15 of the copending application, which discloses a method for receiving and decoding burst radio signals receiving bursts of radio signals on a plurality of radio links comprising receiving an invitation burst for a radio link. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Claim 15 of the copending application teaches all the limitations of Claim 3 of the application.

11. Claim 12 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claim 16 (which includes the limitations of claim 1) of copending Application No. 09/849,687 (PG-Pub No. 2002/0196844). Although the conflicting claims are not identical, they are not patentably distinct from each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Regarding to Claim 12 & 13:

The claim dependent on Claim 1, recites a method for receiving radio signals wherein determining channel information comprises establishing link parameters for a radio link in a new joining node joining the radio system; and storing the link parameters as initial stored channel information, this limitation is disclosed in Claim 16 of the copending application. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Claim 16 of the copending application teaches all the limitations of Claim 12 of the application.

12. Claim 19 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claim 1 of copending Application No. 09/849,687 (PG-Pub No. 2002/0196844). Although the conflicting claims are not identical, they are not patentably distinct from each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Regarding to Claim 19:

The claim dependent on Claim 15, recites a method for receiving radio signals wherein the determining channel information comprises determining the phase of a carrier of the radio signal, this limitation is disclosed in Claim 1 of the copending application. Therefore, it would have been obvious to one of ordinary

skill in the art at the time of the invention that Claim 1 of the copending application teaches all the limitations of Claim 19 of the application.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 1, 2 & 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Houtum et al. (WO 00/16526).

Regarding to Claims 1, 2 & 15-17, the Applicant Admitted Prior Art (AAPA) discloses a communication system (method) for receiving radio signals in a multiple peer-to-peer link hopping radio system (Specification, Page 1, lines 4-9 & Fig. 1 & Specification, Page 8, lines 29-31 & Specification, Page 9, lines 15-19). The AAPA also discloses the system comprising burst transmission of digital data for communication between multiple nodes and between nodes and subscriber units (Specification, Page 1, lines 4-9, 22-30 & Specification, Page 3, lines 20-28). The AAPA also discloses receiving/transmitting data bursts packets in the communication system (Specification, Page 1, lines 22-30 & Specification, Page 2, lines 18-25). However, AAPA does not disclose determining and storing channel information for each radio link from the received burst on the radio link and further

using the determined channel information for the radio link to reliably receive a next received burst on the radio link.

Houtum discloses a system (method) for transmitting/receiving data over a transmission medium (Abstract, lines 1-2 & Specification, Page 1, lines 1-5, 11-19). Houtum also discloses the receiver comprising a channel estimation means for determining at least one property of the transmission channel (Abstract, lines 3-4 & Fig. 1, element 62 & Specification, Page 2, lines 21-26 & Claim 1). Houtum also discloses the transmission property is represented by the coefficients of the equalizer needed to equalize the transmission channel (Abstract, lines 4-5 & Specification, Page 4, lines 9-12). Houtum also discloses the coefficients of the equalizer are stored together with an indication of a corresponding frequency in a memory just before the frequency switch is performed wherein the storing is performed for each of the frequencies to which the receiver can be tuned (Specification, Page 4, lines 25-31 & Specification, Page 2, lines 27-34 & Specification, Page 7, line "KEEP COEFFICIENTS" & Claim 4). Houtum also discloses after a frequency switch has been performed the coefficients, which were stored, previously, when the receiver was tuned at the specified frequency, are retrieved from memory and passed to the equalizer (Abstract, lines 6-7 & Specification, Page 2, lines 32-34 & Specification, Page 4, lines 28-31 & Claim 4). Houtum also discloses an equalizer for equalizing the channel (Fig. 1, element 10). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Houtum teaches determining and storing channel information for

each radio link from the received signal on the radio link and further using the determined channel information subsequently and this can be implemented in the system as described in the AAPA so as to reliably receive a subsequent received burst on the specified radio link. Furthermore, Houtum also teaches the channel information to be represented by equalizer coefficients (weights), thus further satisfying limitations of the claim.

15. Claims 3-8, 11-13, 18-22, 37-41 & 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Houtum et al. (WO 00/16526) in further view of Kagan et al. (6,850,502).

Regarding to Claims 3-8, 11, 18-22, 37-41 & 43, the Applicant Admitted Prior Art (AAPA) in view of Houtum discloses a system (method) for receiving bursts in a link hopping peer-to-peer network comprising determining and storing channel information for each radio link from the received burst on the radio link and further using the determined channel information for the radio link to reliably receive a next received burst on the radio link as described above. The AAPA also discloses each respective data burst and invitation burst comprises data symbols and known pilot symbols at a known timing position inside the respective data burst or invitation burst (Specification, Page 1, lines 26-30 & Specification, Page 2, lines 17-27). The AAPA also discloses in a burst modem requires a special acquisition process so as to identify the bit in the burst is the first user data wherein the phase estimate is determined in the middle of the preamble (Specification, Page 3, lines 20-30 & Specification, Page 4, lines 1-7). The AAPA also discloses a preamble is used for

synchronization purposes and correlation (Specification, Page 1, lines 26-29 & Specification, Page 3, lines 29-30). The AAPA also discloses the use of large QAM constellations the carrier phase estimation is done without the preamble and data aided algorithms are implemented wherein the carrier phase is estimated directly from the modulated signal (Specification, Page 1, lines 26-29 & Specification, Page 2, lines 9-14 & Specification, Page 3, lines 3-6). The AAPA also discloses the phase estimate of the phase of a sample in the middle of the preamble (Specification Page 3, line 30-to-Page 4, line1). However, the AAPA in view of Houtum does not disclose receiving bursts of data signals comprising receiving one of data burst and an invitation burst and further demodulating the received burst.

Kagan discloses a system (method) for transmitting/receiving bursts in a wireless mesh network (Abstract, lines 1-2 & Column 14, lines 1-8). Kagan further discloses receiving bursts of radio signals comprises receiving one of a data burst and an invitation burst (Abstract, lines 10-11 & Column 2, lines 1-2 & Column 3, lines 29-31). Kagan further discloses demodulating the received burst (Column 8, lines 1-4). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Kagan teaches receiving bursts of radio signals comprises receiving one of a data burst and an invitation burst and this can be implemented in the communications system as described in the AAPA in view of Houtum so as to provide a automatic process for extending the coverage and capacity of the network, thus satisfying the limitations of the claim. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the AAPA discloses

a fast acquisition process so as to detect a burst at a certain position in the preamble and therefore, there is no criticality in receiving the burst by detecting two or more pilot symbols, this is a matter of design choice so as to avoid overhead data (short preamble) and reliably receive the burst and increase capacity.

Regarding to Claims 12 & 13, the Applicant Admitted Prior Art (AAPA) in view of Houtum discloses a system (method) for receiving bursts in a link hopping peer-to-peer network comprising determining and storing channel information for each radio link from the received burst on the radio link and further using the determined channel information for the radio link to reliably receive a next received burst on the radio link as described above. However, the AAPA in view of Houtum does not disclose establishing link parameters for a radio link in a new joining node joining the radio system; and storing the link parameters as initial stored channel information.

Kagan discloses a join process for a wireless mesh topology network wherein the wireless mesh topology provides a plurality of connections between the device originating data and the destination data device (Abstract, lines 1-2 & Column 4, lines 40-50 & Fig. 2). Kagan further discloses the join process to include adding a joining node to a network wherein the joining node listens to sub-sectors at a specific receiving frequency for a defined time wherein the active network nodes transmit invitation data packets on defined sectors, frequencies and timing based on relative location and relative angle orientation from sectors already in use for existing communication (Abstract, lines 5-8, 10-14 & Column 2, lines 35-50). Kagan further discloses the joining node scanning the spectrum and spatial directions to receive

the invitation packet transmitted by the inviting network (Column 3, lines 17-31). Kagan further discloses the network node receives information about positions of active nodes in the network and about the position of the joining node, the information of the new node's topographical location may become available to the network and its devices wherein the once the joining process is complete the joining node is now an active node of the network (Column 5, lines 27-35 & Column 6, lines 14-23 & Fig. 5, element 502). Kagan further discloses the joining node to receive scanning information while performing the join process comprising the times to scan, the frequency to scan and the directions to scan (Column 7, lines 45-65 & Fig. 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Kagan teaches a joining process wherein the network nodes provide an invitation burst from the network and other information and this can be implemented in the network as disclosed in the AAPA in view of Houtum so as to provide the channel conditions of each node and sector so as to speed up the joining process, thus satisfying the limitations of the claim.

16. Claims 9 & 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Houtum et al. (WO 00/16526) in further view of Kagan et al. (6,850,502) in further view of Dabak et al. (6,483,821).

Regarding to Claims 9 & 10, the Applicant Admitted Prior Art (AAPA) in view of Houtum in further view of Kagan discloses a system (method) for receiving bursts in a link hopping peer-to-peer network comprising determining and storing channel

information for each radio link from the received burst on the radio link and further using the determined channel information for the radio link to reliably receive a next received burst on the radio link wherein the received bursts includes a data burst and an invitation burst further comprising known pilot symbols as described above. However, the AAPA in view of Houtum in further view of Kagan does not disclose the pilot symbols to comprise consecutive symbols at 180 degrees phase relative to each other.

Dabak discloses a method and apparatus for transmitting and receiving digital information over a wireless communications channel (Abstract, lines 1-6). Dabak also discloses a coherent wireless communications system implementing pilot assisted channel estimation schemes (Column 2, lines 25-35). Dabak also discloses the pilot to be a known periodic pilot symbols inserted into the data sequence (Column 2, lines 35-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Dabak teaches the pilot symbols to comprise consecutive symbols at 180 degrees phase relative to each other and this can be implemented in the system as describe in AAPA in view of Houtum in further view of Kagan so as to provide a simple channel estimation scheme in the receiver.

17. Claims 23 & 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Houtum et al. (WO 00/16526) in further view of Kagan et al. (6,850,502) in further view of Sullivan (PUG-PUB No. 2002/0057733).

Regarding to Claims 23 & 24, the Applicant Admitted Prior Art (AAPA) in view of Houtum in further view of Kagan discloses a system (method) for receiving bursts in a link hopping peer-to-peer network comprising determining and storing channel information for each radio link from the received burst on the radio link and further using the determined channel information for the radio link to reliably receive a next received burst on the radio link as described above. However, the AAPA in view of Houtum in further view of Kagan does not disclose coarse phase estimation to comprise sampling one or more pilot symbols and extracting the phase according to CORDIC algorithm.

Sullivan discloses implementing the CORDIC algorithm for extracting the phase of the samples and forming a complex phasor in response to the extracted phase and de-rotating the data symbols using the complex phasor (Abstract, lines 1-9 & Fig. 1-4 & Page 1, Paragraphs 7-9 & Page 2, Paragraphs 26-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Sullivan teaches implementing the CORDIC algorithm for carrier phase estimation and this can be implemented in the system as described in AAPA in view of Houtum in further view of Kagan so as to provide a simple and more accurate estimation of the carrier phase estimate, thus satisfying the limitations of the claims.

Allowable Subject Matter

18. Claims 25-36 & 42 are allowed.

Response to Arguments

19. Applicant's arguments filed on February 1st, 2005 have been fully considered but they are not persuasive. In regards to the arguments presented regarding to the double patenting rejection of the claims on Page 12, Paragraph 4 (Remarks), the MPEP § 804, paragraph II.B.1.(a) states ".....even if the application at issue is the earlier filed application, only a one-way determination of obviousness is needed to support a double patenting rejection in the absence of a finding of: (A) administrative delay on the part of the Office causing delay in prosecution of the earlier filed application; and (B) applicant could not have filed the conflicting claims in a single (i.e., the earlier filed) application.....". Therefore, the double patenting rejection on the claims has been maintained.

In regards to the arguments presented regarding to the 112 rejections of the claims on Page 11, the arguments have been accepted.

In regards to the drawing objection to Figure 1, the amendment to the figure has been accepted and the objection is withdrawn.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, it is recommended to the applicant to amend all the claims so as to be patentable over the cited prior art of record. A detailed list of pertinent references is included with this Office Action (See Attached "Notice of References Cited" (PTO-892)).

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.

- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)-272-3056
- The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak



STEPHEN CHIN
SUPERVISORY PATENT EXAMINEE
TECHNOLOGY CENTER 2600